STATE INJURY INDICATORS:
Instructions for Preparing 2005 Data

DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

CDC
Injury Prevention

STIPDA
State & Territorial Injury Prevention Directors Association

CSTE
Alaska
Hawaii
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Puerto Rico
U.S. Virgin Islands
Council of State and Territorial Epidemiologists

State Injury Indicators: Instructions for Preparing 2005 Data

U.S. Department of Health and Human Services
Division of Injury Response
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Foreword and Updates

The Centers for Disease Control and Prevention's (CDC) National Center for Injury Prevention and Control (NCIPC) is pleased to provide this document to guide you in preparing the 2005 state injury indicators.

Under CDC Program Announcement 05027, 30 states have been funded to collect and submit state injury indicator data; however, all states and U.S. territories are eligible to voluntarily submit data for inclusion in the multi-state *State Injury Indicators Report*. As more states and U.S. territories voluntarily participate in this surveillance effort, a broader picture of the burden of injuries can be presented and priorities for prevention can be targeted. During the 2004 data collection cycle, 34 states participated by submitting data for inclusion in the multi-state report. We look forward to continuing our work together to advance and improve injury surveillance.

The methods outlined in this document are consistent with those used in previous cycles of injury indicator data collection. These methods are based on recommendations presented in the *Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance* and in the National Public Health Surveillance System (NPHSS) indicators developed by the State and Territorial Injury Prevention Directors Association (STIPDA) and the Council of State and Territorial Epidemiologists (CSTE). With partner feedback, CDC continuously modifies and updates these instructions and methodologies.

Changes for the 2005 data collection cycle include:

- In order to make the two Motor Vehicle Indicators parallel, non-traffic codes have been removed from the Motor Vehicle Hospitalization Indicator.
- The terrorism *International Classification of Diseases, 10th Edition* (ICD-10)[1] codes (*U01–*U03) and *The International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM)[2] codes (E979 and E999.1) have been added to case definitions where appropriate.
- Additional codes have been added to both the Traumatic Brain Injury Fatality and Hospitalization Indicators.
- The ICD-9-CM codes for Systemic Inflammatory Response Syndrome (995.90-995.94) have been excluded from the case definition used to prepare the Injury Hospitalization Data Set.
- Instructions for five additional indicators have been included:
  - All-Injury Indicator 1: Injury Fatalities
  - Fall Indicator 1: Unintentional Fall-Related Fatalities
  - Fall Indicator 2: Unintentional Fall-Related Hospitalizations
  - Fall Indicator 3: Hip Fracture Hospitalizations in Persons Aged 65 Years and Older
  - Homicide/Assault Indicator 2: Assault-Related Hospitalizations

The three Fall Indicators were recommended as a result of the consensus building process of the STIPDA Injury Surveillance Workgroup on Falls.[3] The pre-existing All-Injury and Homicide/Assault areas were expanded to include the corresponding vital statistics or hospital discharge data indicators.

Abbreviations

BAC	Blood alcohol concentration
BRFSS	Behavioral Risk Factors Surveillance System
CDC	Centers for Disease Control and Prevention
CSTE	Council of State and Territorial Epidemiologists
FARS	Fatality Analysis Reporting System
HDD	Hospital discharge data
ICD-10	International Classification of Diseases – Tenth Revision
ICD-9-CM	International Classification of Diseases – Ninth Revision – Clinical Modification
MVC	Motor vehicle crash
SAVIR	Society for Advancement of Violence and Injury Research
NCCDPHP	National Center for Chronic Disease Prevention and Health Promotion
NCHS	National Center for Health Statistics
NCIPC	National Center for Injury Prevention and Control
NHTSA	National Highway Traffic Safety Administration
NPHSS	National Public Health Surveillance System
STIPDA	State and Territorial Injury Prevention Directors Association
TBI	Traumatic brain injury
VA	Veterans Affairs
WHO	World Health Organization
WISQARS	Web-based Injury Statistics Query and Reporting System
YRBS	Youth Risk Behavior Survey

Contents

What is an Injury Indicator?

An injury indicator describes a health outcome of an injury, such as hospitalization or death, or a factor known to be associated with an injury, such as a risk or protective factor among a specified population.

Introduction

Injury surveillance is one of the most important and basic elements of injury prevention and control. It helps determine the magnitude of injury morbidity and mortality, the leading causes of injury, and the population groups and behaviors associated with the greatest risk of injury. Surveillance data are also fundamental to determining program and prevention priorities. Furthermore, these data are crucial for evaluating the effectiveness of program activities and for identifying problems that need further investigation.

Injury continues to be the leading cause of death and disability among children and young adults.[4] In 2004, more than 167,000 people died from injuries in the U.S. Among them: 27% died from motor-vehicle crashes; 19% died from suicide; and 10% died from homicide.[4] Additionally, in 2005, more than 29 million people were treated for injuries in U.S. emergency departments.[4] The economic cost of injuries is also significant. The total cost of the 50 million medically treated injuries sustained in 2000 is estimated to be $406 billion in medical expenses and productivity losses.[5]

The mission of public health includes prevention, mitigation, assurance that the injured have access to treatment, and the reduction of injury-related disability and death.[6] The scope of public health encompasses injuries involving any mechanism (e.g., firearm, motor vehicle, or burn) and includes both intentional and unintentional injuries. An important part of the public health mission is to emphasize that injuries are preventable and to dispel the misconception that injuries are unavoidable.

Recognizing the need for more comprehensive injury surveillance data, the State and Territorial Injury Prevention Directors Association (STIPDA) produced *Consensus Recommendations for Injury Surveillance in State Health Departments* in 1999. These recommendations were developed by a working group representing STIPDA; the Council of State and Territorial Epidemiologists (CSTE); the Centers for Disease Control and Prevention (CDC) and its National Center for Injury Prevention and Control (NCIPC); the Society for Advancement of Violence and Injury Research (SAVIR); and individual state partners.

The *State Health Department Consensus Recommendations* identifies specific injuries and injury risk factors to be placed under surveillance by all states and data sets to monitor these injuries and risk factors. The goal is to improve state-based injury surveillance to better support injury prevention programs and policies. By enhancing and standardizing injury surveillance at the state level, its integration with overall public health surveillance as part of the National Public Health Surveillance System (NPHSS) will be much easier.[7] In tandem with the *State Health Department Consensus Recommendations*, CSTE and STIPDA developed injury indicators that were formally adopted for inclusion in NPHSS.[8,9] The NPHSS injury indicators add to other indicators developed by CSTE for chronic diseases and other areas.[8]

The *Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance,* published in 2003, provides clear and specific recommendations about the evaluation and use of hospital discharge data.[10] It presents important considerations for the evaluation of data quality and outlines the methodology for developing an injury hospitalization data set.

Collection and dissemination of injury indicators is built upon the foundation laid by the publication of these STIPDA and CSTE documents.

Background and Purpose

This manual and affixed CD-ROM (which contains spreadsheets for data submission) was created to guide states and U.S. territories in collecting, preparing, and submitting their injury surveillance data. All states and U.S. territories are eligible to voluntarily submit data for this report.

Information obtained from participants will be reviewed and assembled for inclusion in the *State Injury Indicators Report*. This process provides state and U.S. territory injury programs with a standardized method for evaluating injury data and for producing an injury indicator data product that is comparable across states and U.S. territories.

This manual provides straightforward information to encourage participation of all states and U.S. territories regardless of their epidemiologic infrastructure and capabilities. Participation in this report should not be seen as limiting by states of higher capacity, but rather as a place of commonality and a starting point for developing more sophisticated analysis.

The process of preparing indicators is simplified in that it doesn't include the merging and unduplicating of cases found in both hospital discharge and vital statistics data sets. It is important to keep in mind that the quality of the injury indicators is dependant on the completeness and accuracy of external cause coding found on individual state and U.S. territory data sets.

Centralized electronic hospital discharge data and centralized electronic vital statistics data are used to calculate the indicators prepared and submitted by states and U.S. territories. Injuries resulting in or occurring from the following are currently included in the *State Injury Indicators:* all injury, drowning, fall-related injury, fire-related injury, firearm-related injury, homicide/assault, motor vehicle-related injury, poisoning, suicide/suicide attempt, and traumatic brain injury (TBI). Overlap exists among these indicators. For example, a firearm-related homicide would be included in both the firearm-related death indicator and the homicide indicator.

Preparing the Data Set

Background on State Vital Records

Death registration is the responsibility of individual states. The funeral director and the physician who certify the cause of death are usually responsible for the personal and medical information recorded on the death certificate. The cause-of-death section on the certificate is generally the same in all states and is organized according to World Health Organization (WHO) guidelines and coded with ICD-10.[1] Local registrars assure that deaths in their jurisdictions are registered and that required information is on death certificates before submitting to the state registrar. State registrars number and file the death certificates; certificates of nonresidents are sent to their states of residence. All states send death certificate data to the National Vital Statistics System, managed by CDC's National Center for Health Statistics (NCHS).[11]

Data are limited to information reported on death certificates. The degree of detail in reporting varies among jurisdictions. In general, death certificate data provide limited information about circumstances of injury incidents or contributing factors. The number and type of cause-of-death fields to which states have access also vary, and deaths associated with some injuries, especially suicide, may be underreported. States without access to multiple contributing cause-of-death fields cannot calculate fatality rates for TBI because the diagnostic codes that make up that case definition reside in the contributing cause-of-death fields.

Instructions for Using Vital Statistics Data

Vital statistics data do not require specific preparation for analysis. With the exception of the fatal TBI indicator, all fatal indicators should be calculated by searching the *underlying-cause-of-death field only*. For the fatal TBI indicator, search *all fields* in the multiple cause of death file. Specific code ranges are identified in the individual indicator specification sheets (see pages 9–30).

Background on State Hospital Discharge Data

At least 90% of all states maintain electronic databases of hospital discharge records for nonfederal, acute care hospitals located within their borders.[12] The information collected varies from state to state. Many states use the standard uniform billing form (UB-92) as the basis for their hospital discharge database. Others use only a subset of variables from the UB-92 for their databases, and a few collect additional variables.

The UB-92, developed by the National Uniform Billing Committee, includes the following data elements:

- patient's age,
- sex,
- zip code,
- admission date,
- length of stay,
- total charges,
- principal diagnosis, and
- up to eight additional diagnoses.

For diagnoses resulting from injuries, an external cause of injury (E-code) is also coded. E-codes, listed in ICD-9-CM, describe several aspects of an injury: intentionality; mechanism; and, for unintentional causes of injury, location of occurrence.[2] Completeness of e-coding varies by state.

Instructions for Creating and Using the Injury Hospitalizations Subset of a State Hospital Discharge Data Set

To calculate Injury Hospitalization Indicators, first you need to create an injury subset of hospital discharge records. Create this subset using the following specifications:

- Include only nonfederal, acute care, or inpatient facilities in your hospital discharge data (HDD) injury subset. This **excludes** Veterans Affairs (VA) and other federal hospitals, rehabilitation centers, and psychiatric hospitals.
- Include readmissions, transfers, and deaths occurring in the hospital.
- Include hospitalizations of state residents only.
- If the data are available, out-of-state hospitalizations of state residents should be included.
- Based on the principal diagnosis field, the subset you create will be injury hospitalizations,

defined as follows:

- Select injury cases by searching only the principal diagnostic code field for the included diagnosis codes. Exclude all other records from the injury hospitalization subset, as shown in the chart below:[10]

Include	Exclude
800–909.2, 909.4, 909.9 910–994.9 995.5–995.59 995.80–995.85	< 800 909.3, 909.5 995.0–995.4 995.6–995.7 995.86, 995.89 995.90–995.94 996–999

Once the injury hospitalization subset has been created, calculate the injury indicators case counts as defined on the individual indicator pages. Search for E-codes in the following manner:

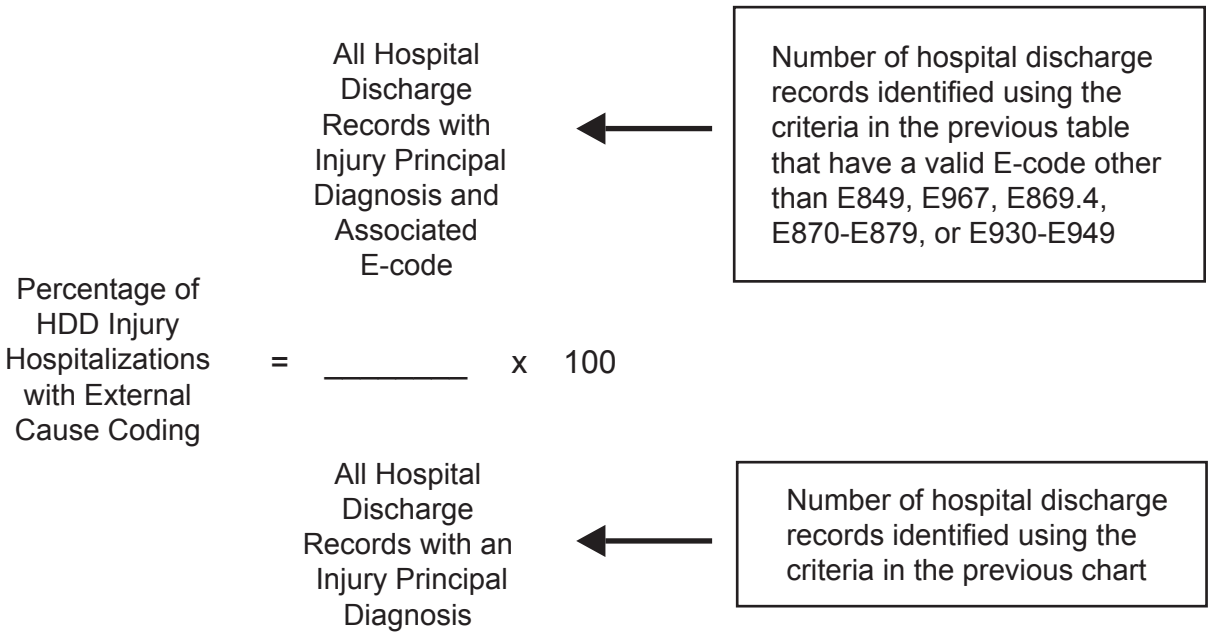
- Search all diagnosis fields.
- If a designated E-code field is in your data set, start with the designated E-code field.
- Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code fields and all diagnostic fields and use the next listed valid E-code. If a case has multiple valid E-codes, then only the first one should be used in the analysis.

Hospitalizations (except for hip fracture hospitalizations in persons aged 65 years and older) should be age-adjusted to the 2000 standard using the NCHS population distribution (Table 1, page 32).

Assess the completeness and quality measures of the HDD for the following components:

- Percentage of HDD injury records with external cause coding (Figure 1, page 8).
- Completeness of hospitals participating in the HDD system.
- Inclusion of readmissions and transfers within the data set used for analysis.
- A subjective assessment by health department staff if a substantial proportion of state residents injured in-state are actually hospitalized in a neighboring state.

Figure 1.


Percentage of HDD Injury Hospitalizations with External Cause Coding
=
All Hospital Discharge Records with Injury Principal Diagnosis and Associated E-code
x 100
All Hospital Discharge Records with an Injury Principal Diagnosis
Number of hospital discharge records identified using the criteria in the previous table that have a valid E-code other than E849, E967, E869.4, E870-E879, or E930-E949
Number of hospital discharge records identified using the criteria in the previous chart

Injury Indicators

The following pages contain specific case definitions for each of the individual injury indicators. These case definitions should be applied when determining case counts. Once the case counts are determined, they should be entered into the accompanying spreadsheets for rate calculation and submission to CDC.

All-Injury Indicator 1: Injury Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Injury Fatality ICD-10 Codes

V01 – Y36, Y85-Y87, Y89, *U01-*U03	Injury and poisoning

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005—RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Injuries are the leading cause of death for people 1 to 44 years of age and the third leading cause of death overall.[4] Over 167,000 people died from injuries in 2004.[4]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15-13: Reduce deaths caused by unintentional injuries
15-32: Reduce homicides

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Crosscutting

All-Injury Indicator 2: Hospitalizations for All Injuries

Demographic group

All residents.

Numerator

Hospitalizations with any of the following ICD-9-CM diagnostic codes. These should be identified by searching for diagnosis codes only in the principal diagnostic field of the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset). The case count for injury hospitalizations should equal the number of records in your injury hospitalization subset.

Hospitalizations for All Injuries ICD-9-CM Codes

Diagnosis codes	
800–909.2, 909.4, 909.9–994.9, 995.5–995.59, 995.80–995.85	Injury and poisoning

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Injury is the leading cause of death and disability among children and young adults in the United States.[4]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding.

Healthy People objectives

15–12: Reduce hospital emergency department visits caused by injuries
15–14: (Developmental) Reduce nonfatal unintentional injuries

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Crosscutting

Drowning Indicator 1: Unintentional Drowning Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Unintentional Drowning Fatality ICD-10 Codes

W65–W74	Accidental drowning and submersion
V90	Accident to watercraft causing drowning and submersion
V92	Water-transport-related drowning and submersion without accident to watercraft

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Drowning is one of the 10 leading causes of injury death for persons under age 45 years. In the United States, drowning rates are highest among children under five years of age.[4]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15–29: Reduce drownings

CDC's health protection goals

Healthy People in Every Stage of Life: Start Strong
Healthy People in Every Stage of Life: Grow Safe and Strong
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Travel and Recreation

Drowning Indicator 2: Nonfatal Drowning Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations with any of the following ICD-9-CM diagnostic or E-codes identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset). These should be identified by searching for diagnosis codes in all diagnostic fields and by searching for E-codes in the following manner: Search all diagnosis fields. If a designated E-code field is in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code and diagnostic fields and use the next listed valid E-code.

Nonfatal Drowning Hospitalization ICD-9-CM Codes

Diagnosis codes	
994.1	Drowning and nonfatal submersion
and/or E-codes	
E830	Accident to watercraft causing submersion
E832	Other accidental submersion or drowning in water transport accident
E910	Accidental drowning or submersion
E954	Suicide and self-inflicted injury by submersion (drowning)
E964	Assault by submersion (drowning)
E984	Submersion (drowning), undetermined whether accidentally or purposefully inflicted

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Nonfatal drowning can result in lifelong disability. Among adolescents and adults, risk factors for drowning include drinking alcohol, swimming alone, and not wearing a personal flotation device while engaged in water sports or recreation. For children under age 5, unexpected access to water or brief lapses in adult supervision are implicated in most drowning incidents.[14]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

No objective.

CDC's health protection goals

Healthy People in Every Stage of Life: Start Strong
Healthy People in Every Stage of Life: Grow Safe and Strong
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Travel and Recreation

Fall Indicator 1:
Unintentional Fall-Related Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Unintentional Fall-Related Fatality ICD-10 Codes

W00-W19	Falls

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005—RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Unintentional falls are the third leading cause of injury death overall and the leading cause of injury death in people 65 years and older.[4] In 2004, there were 18,807 unintentional fall-related deaths.[4]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15-27: Reduce deaths from falls

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Crosscutting

Fall Indicator 2:
Unintentional Fall-Related Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset) by searching for E-codes in the following manner: Search all diagnosis fields. If a designated E-code field is in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code and diagnostic fields and use the next listed valid E-code.

Unintentional Fall-Related Hospitalization ICD-9-CM Codes

E880–E886, E888	Accidental falls

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005—RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

More than one third of adults 65 and older fall each year.[15,16] Of those who fall, 20% to 30% suffer moderate to severe injuries that make it hard to get around or live alone and increase the chance of early death.[17] The total direct cost of nonfatal fall injuries for people 65 and older in 2000 was $19 billion.[18]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

No objective.

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Crosscutting

Fall Indicator 3:
Hip Fracture Hospitalizations in Persons Aged 65 Years and Older

Demographic group

All residents aged 65 years and older.

Numerator

Hospitalizations with the following ICD-9-CM diagnostic code. These should be identified by searching all diagnostic fields of the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset).

Hip Fracture Hospitalization ICD-9-CM Code

Diagnosis codes	
820	Fracture of neck of femur

Denominator

Midyear population of those 65 years and older for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005—RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude. Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

In 2004, there were an estimated 289,000 hospital admissions for hip fractures in people 65 years and older.[19] Up to 25% of adults who lived independently before their hip fracture have to stay in a nursing home for at least a year after their injury[20] and as many as 20% of hip fracture patients die within a year of their injury.[21]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding.

Healthy People objectives

15-28: Reduce hip fractures among older adults

CDC's health protection goals

Healthy People in Every Stage of Life: Live Better, Longer
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Healthcare Settings
Healthy People in Healthy Places: Healthy Institutions
Healthy People in Healthy Places: Healthy Travel and Recreation

Fire-Related Indicator 1: Unintentional Fire-Related Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Unintentional Fire-Related Fatality ICD-10 Codes

X00–X09	Exposure to smoke, fire, and flames

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

The United States mortality rate from fires ranks sixth among the 25 developed countries for which statistics are available.[22] Four out of five deaths in 2005 occurred in homes[23] and approximately half of home fire deaths occurred in homes without fire alarms.[24]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15–25: Reduce residential fire deaths

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Healthy Homes

Fire-Related Indicator 2: Unintentional Fire-Related Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset) by searching for E-codes in the following manner: Search all diagnosis fields. If a designated E-code field is in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code and diagnostic fields and use the next listed valid E-code.

Unintentional Fire-Related Hospitalization ICD-9-CM Codes

E890–E899	Accident caused by fire and flames

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

In 2005, fire departments responded to 396,000 home fires in the U.S., which claimed the lives of 3,030 people (not including firefighters) and injured another 13,825 (not including firefighters).[23] Residential fires disproportionately affect young children, older adults, African Americans, and Native Americans.[25] Working smoke alarms reduce the chance of dying in a house fire by 40% to 50%; however, about 25% of U.S. households lack working smoke alarms.[26,27]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

No objective.

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Healthy Homes

Firearm-Related Indicator 1: Firearm-Related Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Firearm-Related Fatality ICD-10 Codes

W32–W34	Exposure to inanimate mechanical forces– firearm discharge
X72–X74	Intentional self-harm by firearm discharge
X93–X95	Assault by firearm discharge
Y22–Y24	Firearm discharge of undetermined intent
Y35.0	Legal intervention involving firearm discharge
*U01.4	Terrorism involving firearms

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Firearm-related injuries were the second leading cause of injury-related death in the United States, accounting for about 29,500 deaths in 2004.[4] Nationally, the firearm-related death rate for males is almost seven times higher than that of females.[28]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15–3: Reduce firearm-related deaths

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Schools

Firearm-Related Indicator 2: Firearm-Related Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset) by searching for E-codes in the following manner: Search all diagnosis fields. If a designated E-code field is in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949, in which case, search additional E-code and diagnostic fields and use the next listed valid E-code.

Firearm-Related Hospitalization ICD-9-CM Codes

E922.0–E922.3, E922.8, E922.9	Accident caused by firearm missile
E955.0–E955.4	Suicide and self-inflicted injury by firearms
E965.0–E965.4	Assault by firearms
E985.0–E985.4	Injury by firearms, undetermined whether accidentally, or purposely inflicted
E970	Injury due to legal intervention by firearms
E979.4	Terrorism involving firearms

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Nonfatal firearm-related injury rates are highest among persons ages 15 to 24 years. About one fifth of nonfatal firearm-related injuries treated in U.S. hospital emergency departments are unintentional.[28]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

15–5: Reduce nonfatal firearm-related injuries

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Schools

Homicide/Assault Indicator 1: Homicides

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Homicide ICD-10 Codes

X85–Y09	Assault
Y87.1	Sequelae of assault
*U01	Terrorism-assault
*U02	Sequelae of terrorism-assault

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Homicide is the fifteenth leading cause of death in the United States; it is the second most common cause of death among persons ages 15 to 24 years.[4]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15–32: Reduce homicides

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Schools

Homicide/Assault Indicator 2: Assault-Related Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset) by searching for E-codes in the following manner: Search all diagnosis fields. If a designated E-code field is in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code and diagnostic fields and use the next listed valid E-code.

Assault-Related Hospitalization ICD-9-CM Codes

E960-E969	Injury purposely inflicted by other persons
E979	Terrorism
E999.1	Late effect of injury due to terrorism

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005—RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

In 2005, over 1.6 million people were treated in U.S. emergency departments for assault-related injuries with 114,000 of them hospitalized or transferred for a higher level of care.[4]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

15-34: Reduce the rate of physical assault by current or former intimate partners
15-37: Reduce physical assaults
15:38: Reduce physical fighting among adolescents

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Schools

Motor Vehicle Indicator 1: Motor Vehicle Traffic Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Motor Vehicle Traffic Fatality ICD-10 Codes

V02–V04 (.1, .9), V09.2	Pedestrian injured in transport accident
V12–V14 (.3–.9), V19 (.4–.6)	Pedal cyclist injured in transport accident
V20–V28 (.3–.9), V29 (.4–.9)	Motorcycle rider injured in transport accident
V30–V39 (.4–.9)	Occupant of three-wheeled motor vehicle injured in transport accident
V40–V49 (.4–.9)	Car occupant injured in transport accident
V50–V59 (.4–.9)	Occupant of pick-up truck or van injured in transport accident
V60–V69 (.4–.9)	Occupant of heavy transport vehicle injured in transport accident
V70–V79 (.4–.9)	Bus occupant injured in transport accident
V80 (.3–.5), V81.1, V82.1, V83–V86 (.0–.3), V87 (.0–.8), V89.2	Other land transport accidents

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Motor vehicle crashes are the leading cause of injury death in the United States. They are also the leading injury cause for years of potential life lost.[4]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that all cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15–15: Reduce deaths caused by motor vehicle crashes
15–16: Reduce pedestrian deaths on public roads
26–1: Reduce deaths and injuries caused by alcohol- and drug-related motor vehicle crashes

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Every Stage of Life: Live Better, Longer
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Travel and Recreation

Motor Vehicle Indicator 2:
Motor Vehicle Traffic Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset) by searching for E-codes in the following manner: Search all diagnosis fields. If a designated E-code field is in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code and diagnostic fields and use the next listed valid E-code.

Motor Vehicle Traffic Hospitalization ICD-9-CM Codes

E810–E819	Motor vehicle traffic accidents

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

In 2005, motor vehicle crashes were the cause of more than 4.3 million emergency department visits in the United States.[4] It is estimated that front seat occupants who use lap/shoulder belts reduce their risk for fatal injury by about 45% and for moderate to critical injury by 45% to 50%.[29]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

15–17: Reduce nonfatal injuries caused by motor vehicle crashes
15–18: Reduce nonfatal pedestrian injuries on public roads
26–1: Reduce deaths and injuries caused by alcohol- and drug-related motor vehicle crashes

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Every Stage of Life: Live Better, Longer
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Travel and Recreation

Poisoning Indicator 1: Poisoning Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Poisoning Fatality ICD-10 Codes

X40–X49	Accidental poisoning by and exposure to noxious substances
X60–X69	Intentional self-poisoning
X85–X90	Assault by poisoning
Y10–Y19	Poisoning of undetermined intent
Y35.2	Legal intervention involving gas
*U01 (.6–.7)	Terrorism involving biological or chemical weapons

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Poisoning is the result of the damaging effect of exposure to a broad range of chemicals (e.g., gases, pesticides, heavy metals, drugs, and common household substances such as bleach and ammonia). In 2004, 30,300 people in the United States died from poisoning.[4]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

15–8: Reduce deaths caused by poisonings

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Workplaces
Healthy People in Healthy Places: Healthy Healthcare Settings

Poisoning Indicator 2: Poisoning Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset) by searching for E-codes in the following manner: Search all diagnosis fields. If a designated E-code field is in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code and diagnostic fields and use the next listed valid E-code.

Poisoning Hospitalization ICD-9-CM Codes

E850–E858	Accidental poisoning by drugs, medicinal substances, and biologicals
E860–E869	Accidental poisonings by other solid and liquid substances, gases, and vapors
E950–E952	Suicide and self-inflicted poisoning
E962	Assault by poisoning
E972	Injury due to legal intervention by gas
E980–E982	Poisoning undetermined whether accidentally or purposefully inflicted
E979 (.6–.7)	Terrorism involving biological or chemical weapons

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

In 1999, 21 states reported that hospitalization rates were 4 to 15 times higher than death rates for poisoning-related injuries.[30]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

15–7: Reduce nonfatal poisonings

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Healthy Communities
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Workplaces
Healthy People in Healthy Places: Healthy Healthcare Settings

Suicide Indicator 1: Suicides

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes as an underlying cause of death.

Suicide ICD-10 Codes

X60–X84	Intentional self-harm
Y87.0	Sequelae of intentional self-harm
*U03	Terrorism-intentional self-harm

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

In 2004, suicide was the second leading cause of death among adults ages 25 to 34 years and the third leading cause of death for adolescents and young adults ages 10 to 24 years.[4]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding. The overall completeness of external cause coding on death data is uniformly high. Coding criteria specify that cases of injury death must contain an injury code in the *underlying-cause-of-death field.*

Healthy People objectives

18–1: Reduce the suicide rate

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Schools

Suicide Indicator 2: Suicide Attempt Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations identified from the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset) by searching for E-codes in the following manner: Search all diagnosis fields. If there is a designated E-code field in your data set, start with the designated E-code field. Count the first-listed valid E-code, unless it is E849, E967, E869.4, E870–E879, or E930–E949; in which case, search additional E-code and diagnostic fields and then use the next listed valid E-code.

Suicide Attempt Hospitalization ICD-9-CM Codes

E950–E959	Suicide and self-inflicted injury

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

In 2005, there were an estimated 373,000 hospital emergency department visits for suicide attempts in the United States.[4]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding. The overall completeness of e-coding is of particular concern and should be reviewed in conjunction with the indicator.

Healthy People objectives

18–2: Reduce the rate of suicide attempts by adolescents

CDC's health protection goals

Healthy People in Every Stage of Life: Achieve Healthy Independence
Healthy People in Every Stage of Life: Live a Healthy, Productive, and Satisfying Life
Healthy People in Healthy Places: Healthy Homes
Healthy People in Healthy Places: Healthy Schools

Traumatic Brain Injury Indicator 1: Traumatic Brain Injury Fatalities

Demographic group

All residents.

Numerator

Deaths with any of the following ICD-10 codes in any field of the multiple cause of death file.

Traumatic Brain Injury Fatality ICD-10 Codes

S01.0–S01.9	Open wound of head
S02.0, S02.1, S02.3, S02.7–S02.9	Fracture of skull and facial bones
S04.0	Injury of optic nerve and pathways
S06.0–S06.9	Intracranial injury
S07.0, S07.1, S07.8, S07.9	Crushing injury of head
S09.7–S09.9	Other and unspecified injuries of head
T01.0*	Open wounds involving head with neck
T02.0*	Fractures involving head with neck
T04.0*	Crushing injuries involving head with neck
T06.0*	Injuries of brain and cranial nerves with injuries of nerves and spinal cord at neck level
T90.1, T90.2, T90.4, T90.5, T90.8, T90.9	Sequelae of injuries of head

* These codes are not considered valid in the US

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of deaths. Annual mortality rate—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

Death certificate data from vital statistics agencies (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

Of the approximately 1.6 million people who sustained a TBI in the United States in 2003, an estimated 51,000 died; 290,000 were hospitalized; and 1.2 million were treated and released from an emergency department.[31]

Limitations of indicator

Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. An evaluation of only these injuries may not present an accurate picture of the causes of less-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in vital statistics data is limited by the completeness and quality of coding.

Healthy People objectives

No objective.

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Crosscutting

Traumatic Brain Injury Indicator 2: Traumatic Brain Injury Hospitalizations

Demographic group

All residents.

Numerator

Hospitalizations with any of the following ICD-9-CM diagnostic codes. These should be identified by searching all diagnostic fields of the injury hospital discharge subset (see methods on page 6 for developing the injury hospital discharge subset).

Traumatic Brain Injury Hospitalization ICD-9-CM Codes

Diagnosis codes	
800.00-801.99	Fracture of the vault or base of the skull
803.00-804.99	Other and unqualified or multiple fractures of the skull
850.0-850.9	Concussion
851.00-854.19	Intracranial injury, including contusion, laceration, and hemorrhage
950.1-950.3	Injury to the optic chiasm, optic pathways, or visual cortex
959.01	Head injury, unspecified
995.55	Shaken infant syndrome

Denominator

Midyear population for the calendar year under surveillance. To obtain population estimates by age and sex for your state, use U.S. Census Bureau population tables titled "State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT" (see instructions on page 31).

Measures of frequency

Annual number of persons hospitalized. Annual incidence—crude and age-adjusted (standardized by the direct method to the year 2000 standard U.S. population).[13] Rates should be calculated for age and sex.

Data resources

State hospital discharge data (numerator) and population estimates from the U.S. Census Bureau or suitable alternative (denominator).

Period for case definition

Calendar year.

Background

An estimated 5.3 million Americans live with a TBI-related disability. According to one study, about 40% of those hospitalized with a TBI had at least one unmet need for services one year after their injury.[32,33]

Limitations of indicator

Injuries that result in a hospital admission represent only a portion of the overall burden of injury. Evaluations of these injuries should be considered in the context of both less- and more-severe injuries.

Limitations of data resources

The accuracy of indicators based on codes found in hospital discharge data is limited by the completeness and quality of coding.

Healthy People objectives

15–1: Reduce hospitalization for nonfatal head injuries

CDC's health protection goals

Healthy People in Every Stage of Life: Crosscutting
Healthy People in Healthy Places: Crosscutting

Calculating and Submitting Rates

Calculation Formula and Instructions

Preformatted rate calculation spreadsheets have been prepared for both the hospital discharge and vital records-based indicators. These spreadsheets can be found on the affixed CD-ROM located inside the front cover of this manual. Completion of the spreadsheet requires:

- Answering a few data background questions;
- Inserting state population data;
- Entering case counts for individual indicators; and
- Renaming the spreadsheets to reflect state and submission number.

Rate calculations include several types of rates (i.e., age-specific crude rates and age-adjusted rates). The following rate calculation specifications have been preprogrammed into the spreadsheet. If you are preparing these data independent of the spreadsheet, please be sure to follow the same specifications.

- Use the estimated population for the year of the data. This information may be obtained from several sources:
    - www.census.gov/popest/datasets.html (preferred)
        - Scroll to “State population datasets”
        - Continue scrolling to “State Estimates by Demographic Characteristics– Age, Sex, and Hispanic Origin”
        - Continue scrolling to “State Single Year of Age and Sex Population Estimates: April 1, 2000 to July 1, 2005 – RESIDENT”
        - Download File layout
        - Download CSV File
    - your state’s demographic center
- Compute rates per 100,000 population.
- For each indicator, except hip fracture hospitalizations, report age-adjusted rates stratified by sex (female and male), and report the overall age-adjusted rate for the state.

- Report age-specific rates for each indicator in the following age categories:

Under 1	
1–4	45–54
5–14	55–64
15–24	65–74
25–34	75–84
35–44	85+

> It is possible to obtain the anomalous looking overall age-adjusted rate which does not fall between the two gender-specific age-adjusted rates. Such outcomes are mathematically possible and should be included.

Calculate age-adjusted rates using the age-specific U.S. standard population weights from Table 1.

Table 1. Age Adjustment Table

All Ages — Eleven Age Groups

Age	**U.S. 2000 Standard Population** (1,000's)	**Adjustment Weights**
All ages	274,634	1.000000
Under 1	3,795	0.013818
1–4	15,192	0.055317
5–14	39,977	0.145565
15–24	38,077	0.138646
25–34	37,233	0.135573
35–44	44,659	0.162613
45–54	37,030	0.134834
55–64	23,961	0.087247
65–74	18,136	0.066037
75–84	12,315	0.044842
85+	4,259	0.015508

Additional Resources

Other Recommended Data Systems

Indicators based on the Behavioral Risk Factor Surveillance System (BRFSS), the Youth Risk Behavior Survey (YRBS), and the Fatality Analysis Reporting System (FARS) will be calculated at CDC. The data available from YRBS and BRFSS will be examined annually to determine which survey questions should be included.

Behavioral Risk Factor Surveillance System (BRFSS)

CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) manages the BRFSS. This is a broad ongoing survey. It is also a state-based, random-digit-dialed telephone survey of the noninstitutionalized U.S. population over age 17. BRFSS monitors risk behaviors associated with the leading causes of disease, injury, and death.[34]

Because BRFSS is telephone-based, population subgroups less likely to have telephones, such as persons of low socioeconomic status, may be underrepresented. In addition, data are self-reported and may be biased. For risk-reduction factors such as self-reported use or testing of smoke alarms, these data may not uniformly represent safe and effective use.[34]

Additionally, not all BRFSS questions are asked every year. Questions asked during the year for which a current Injury Indicator Report is being prepared will be reviewed and appropriate questions included in the report. Results will be reported as a percentage of respondents.

Summary of BRFSS

- BRFSS indicator data can be found online at www.cdc.gov/brfss.
- Indicators are reported as percentage of respondents.
- Example: Percentage of Adults Reporting Driving after Perhaps Having Too Much to Drink, in the Past Month: *How often have you driven after having perhaps too much to drink during the last 30 days?* Percentage answering "one or more times" would be reported.
- Injury Indicator-related questions on the 2005 BRFSS: None.

Youth Risk Behavior Survey (YRBS)

YRBS, a component of the Youth Risk Behavior Surveillance System, is managed by NCCDPHP at CDC. The YRBS monitors risk behaviors associated with the leading causes of injury and death among teenagers.[35] State and local departments of education and health conduct the survey biennially in many locations throughout the country. The school-based survey is administered to 9th through 12th graders and the data is analyzed by CDC.

YRBS data apply only to youth who attend school. The extent of underreporting or overreporting of behaviors cannot be determined, although the survey questions demonstrate good test–retest reliability. Interstate comparisons must be interpreted cautiously because the methods used to collect YRBS data may vary.[35]

Among the 30 funded states, 23 conducted a YRBS in 2005 with overall participation rates of at least 60%.[36] CDC requires a minimum overall participation rate of 60% to generalize the results to the state's population. States with YRBS data meeting this criterion will be included. Results will be reported as a percentage of respondents. No age adjustment will be applied.

Summary of YRBS

- Biennial survey.
- Indicators are reported as percentage of respondents.
- Data are available at www.cdc.gov/HealthyYouth/yrbs/index.htm.
- Not age adjusted.
- Example: Percentage of High School Students Reporting Suicide Attempt During Past 12 Months: Percentage of respondents answering "one or more attempts" would be reported.
- Example: Percentage of High School Students Reporting Always Using Safety Belts: *How often do you wear a seatbelt when riding in a car driven by someone else?* Percentage of respondents answering "Always" would be reported.
- Injury Indicator-related questions on the 2005 YRBS:
  - How often do you wear a seatbelt when riding in a car driven by someone else?
  - During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?
  - During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?
  - During the past 12 months, did you ever seriously consider attempting suicide?
  - During the past 12 months, did you make a plan about how you would attempt suicide?
  - During the past 12 months, how many times did you actually attempt suicide?

Fatality Analysis Reporting System (FARS)

FARS, coordinated by the National Highway Traffic Safety Administration (NHTSA), contains data on all fatal traffic crashes that occur in the 50 states, the District of Columbia, and Puerto Rico. For inclusion in FARS, a crash must involve a motor vehicle traveling on a public roadway and result in the death of a person (either a vehicle occupant or a non-motorist) within 30 days of the crash. The FARS file contains a description of each fatal crash reported. More than 100 coded data elements characterize each crash, the vehicles, and the people involved. NHTSA considers a fatal motor-vehicle crash to be alcohol-related if either a driver or non-occupant (e.g., pedestrian or bicyclist) had a blood alcohol concentration (BAC) greater than or equal to 0.01 g/dL.[37]

FARS does not include non-traffic crashes such as those occurring on driveways and other private property. It also does not include deaths occurring more than 30 days after the motor vehicle crash. Because BACs are not available for all persons involved in fatal crashes, NHTSA's estimates for alcohol-related traffic fatalities are based on a discriminant analysis of information from all cases for which driver or non-occupant BAC data are available.[37]

State-specific counts are published by NHTSA in the annual publication, *Traffic Safety Facts*. CDC will calculate the crude alcohol-involved motor vehicle crash (MVC) death rate using the data in Table 114 "Persons Killed, by State and Highest Blood Alcohol Concentration in the Crash." The numerator for this rate is in the column "Total Killed in Alcohol-Related Crashes" and the denominator is the estimated state population for the year. Using this method, it is not possible to calculate age-adjusted rates because age-specific counts are not provided in the tables.

References

1. International Classification of Diseases 10th Revision [online]. [cited 2006 Dec 10]. Available from URL: http://www.who.int/classifications/apps/icd/icd10online/.
2. International Classification of Diseases 9th Revision Clinical Modification [online]. [cited 2006 Dec 10]. Available from URL: www.cdc.gov/nchs/about/otheract/icd9/abticd9.htm.
3. Injury Surveillance Workgroup on Falls. *Consensus Recommendations for Surveillance of Falls and Fall-Related Injuries*. Atlanta (GA): State and Territorial Injury Prevention Directors Association, 2006.
4. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. (2005) [cited 2006 Dec 7]. Available from URL: www.cdc.gov/ncipc/wisqars.
5. Finkelstein EA, Corso PS, Miller TR, Associates. *Incidence and Economic Burden of Injuries in the United States.* New York: Oxford University Press; 2006.
6. Institute of Medicine (US). *Reducing the Burden of Injury, Advancing Prevention and Treatment*. Washington (DC): National Academy Press; 1999.
7. Meriwether RA. Blueprint for a national public health surveillance system for the 21st century. *J Public Health Manag Pract* 1996;216–23.
8. Council of State and Territorial Epidemiologists. *Injury Control and Prevention Position Statement*. [cited 2005 Nov 28]. Available from URL: www.cste.org/PS/Default.htm.
9. State and Territorial Injury Prevention Directors Association (STIPDA) resolutions, October 1999. [cited 2005 Nov 28]. Available from URL: www.stipda.org/documents/99css.htm.
10. Injury surveillance workgroup. *Consensus Recommendations for Using Hospital Discharge Data for Injury Surveillance*. Marietta (GA): State and Territorial Injury Prevention Directors Association; 2003.
11. Centers for Disease Control and Prevention. Mortality Data from the National Vital Statistics System. [cited 2007 Dec 10]. Available from URL: http://www.cdc.gov/nchs/deaths.htm.
12. Abellera J, Annest JL, Conn JM, Kohn M. *How states are collecting and using cause of injury data: 2004 update of the 1997 report*. A survey by CSTE, APHA-ICEHS, and STIPDA [online]. [cited 2007 Jan 8]. Available from URL: http://www.cste.org/pdffiles/newpdffiles/ECodeFinal3705.pdf.
13. Klein RJ, Schoenborn CA. *Age adjustment using the 2000 projected U.S. population*. Hyattsville (MD): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, 2001. Healthy People 2010 statistical notes, No. 20.
14. Fletemeyer JR, Freas SJ, editors. *Drowning: new perspectives on intervention and prevention*. Boca Raton (FL): CRC Press; 1998.
15. Hornbrook MC, Stevens VJ, Wingfield DJ, Hollis JF, Greenlick MR, Ory MG. Preventing falls among community-dwelling older persons: results from a randomized trial. *The Gerontologist* 1994;34(1):16–23.
16. Hausdorff JM, Rios DA, Edelber HK. Gait variability and fall risk in community-living older adults: a 1-year prospective study. *Archives of Physical Medicine and Rehabilitation* 2001;82(8):1050–6.
17. Alexander BH, Rivara FP, Wolf ME. The cost and frequency of hospitalization for fall-related injuries in older adults. *American Journal of Public Health* 1992;82(7):1020–3.
18. Stevens JA, Corso PS, Finkelstein EA, Miller TR. The costs of fatal and nonfatal falls among older adults. *Injury Prevention* 2006;12:290–5.
19. Kozak LJ, DeFrances CJ, Hall MJ. National Hospital Discharge Survey: 2004 annual summary with detailed diagnosis and procedure data. National Center for Health Statistics. *Vital Health Stat* 13(162). 2006.

20. Magaziner J, Hawkes W, Hebel JR, Zimerman SI, Fox KM, Dolan M, et al. Recovery from hip fracture in eight areas of function. *Journal of Gerontology: Medical Sciences* 2000;55A(9):M498–507.
21. Leibson CL, Toteson ANA, Gabriel SE, Ransom JE, Melton JL III. Mortality, disability, and nursing home use for persons with and without hip fracture: a population-based study. *Journal of the American Geriatrics Society* 2002;50:1644–50.
22. International Association for the Study of Insurance Economics. *World fire statistics: information bulletin of the world fire statistics*. Geneva (Switzerland): The Geneva Association; 2003.
23. Karter MJ. *Fire loss in the United States during 2005,* Abridged report. Quincy (MA): National Fire Protection Association, Fire Analysis and Research Division; 2006.
24. Ahrens M. *U.S. experience with smoke alarms and other fire alarms*. Quincy (MA): National Fire Protection Association; 2004.
25. Mallonee S, Istre G, Rosenberg M, Reddish-Douglas M, Jordan F, Silverstein P, et al. Surveillance and prevention of residential-fire injuries. *N Eng J Med* 1996;335:27–31.
26. Ahrens M. *U.S. experience with smoke alarms and other fire alarms*. Quincy (MA): National Fire Protection Association; 2001.
27. Smith CL. *Smoke detector operability survey-report findings*. Bethesda (MD): U.S. Consumer Product Safety Commission; 1993 Nov.
28. Gotsch KE, Annest JL, Mercy JA, Ryan GW. Surveillance for fatal and nonfatal firearm-related injuries-United States, 1993–1998. In: *CDC surveillance summaries*; 2001 Apr 13. *MMWR* 2001;50 (No. SS-2).
29. Department of Transportation (US), National Highway traffic Safety Administration. *Traffic safety facts 1999 occupant protection*; 2000; Publication No.: DOT HS 809 090.
30. Thomas C, Butler J, Davies M, Johnson R. *State Injury Indicators Report, second edition—1999 data*. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2004.
31. Langlois JA, Rutland-Brown W, Thomas KE, Xi YL. Incidence of traumatic brain injury in the United States, 2003. *J Head Trauma Rehabil* 2006;21: 544-8.
32. Thurman D, Alverson C, Dunn K, Guerrero J, Sniezek J. Traumatic brain injury in the United States: A public health perspective. *J Head Trauma Rehabil* 1999;14(6):602–15.
33. Corrigan JD, Whiteneck G, Mellick D. Perceived needs following traumatic brain injury. *J Head Trauma Rehabil* 2004;19(3):205–16.
34. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. [accessed 2006 Dec 11]. Available from URL: www.cdc.gov/brfss.
35. Centers for Disease Control and Prevention. Youth Risk Behaviors Surveillance System. [accessed 2006 Dec 11]. Available from URL: www.cdc.gov/nccdphp/dash/yrbs/index.htm.
36. Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance—United States, 2005. In: *CDC surveillance summaries*; 2006 Jun 9. *MMWR* 2006;55 (No. SS-5).
37. National Highway Traffic Safety Administration. Fatality Analysis System. [accessed 2007 Mar 14]. Available from URL: http://www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSFAnn/TSF2005.pdf.

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www.cdc.gov/injury